

California Environmental Protection Agency



**Air Resources Board**

# **Low Carbon Fuel Standard**

***Crude Oil Screening  
Workgroup***

***May 6, 2010***

# Agenda

- Welcome and introductions
- Background and objectives
- Structure of overall crude screening process
- Some issues raised at the first meeting
- Presentation by Jacobs Consultancy/Life Cycle Associates
- Availability of data for screening process
- Possible framework for primary screening step
- Future steps
- Other discussion items?

# Important Definitions

- “included in the 2006 California baseline crude mix” means the crude oil constituted at least 2.0 percent of the 2006 California baseline crude mix, by volume, as shown by California Energy Commission records for 2006.
- “high carbon intensity crude oil” means any crude oil that has a total production and transport carbon intensity value greater than 15 gCO<sub>2</sub>e/MJ.

# Carbon Intensity for CARBOB and Diesel

- Lookup Table carbon intensity values are weighted averages based on the 2006 California baseline crude mix.
- These average CI values are used if crude oil:
  - Is included in the 2006 California baseline mix or
  - Is not a high carbon intensity crude oil
- Crude oil from sources not included in the 2006 California baseline mix must be screened.



## Crude Sources by Country

- For 2009, less than 0.2% originated from Thailand, Russia, Bolivia, Australia, Azerbaijan, Chad, Trinidad and Tobago, and Vietnam.
- Source for 2006-2008 Data: <http://www.energyalmanac.ca.gov/petroleum/statistics/>
- \*2009 data are unofficial estimates.

Source	2006	2008	2009*
California	38.83	38.12	54.6
Alaska	16.12	13.41	
Saudi Arabia	13.27	12.65	11.3
Ecuador	10.86	9.53	7.8
Iraq	8.57	11.62	8.5
Brazil	2.74	3.98	4.2
Mexico	2.36		
Angola	2.29	1.19	2.3
Columbia	1.43	3.03	2.6
Oman	0.97	0.61	1.6
Venezuela	0.63	0.58	0.9
Argentina	0.53		0.8
Canada		1.43	2.3
Kuwait		0.47	0.5
Peru			1.0
UAE			0.8
All Others	1.42	3.37	0.8



# Workgroup Objectives

- Develop a recommendation for a screening process to be used to determine the appropriate carbon intensity assigned to fuels derived from crude oil sources which are not “included in the 2006 California baseline crude oil mix”.
- Develop a recommendation for the level of specificity to be used when screening crude oil sources which are not “included in the 2006 California baseline crude oil mix”.

# Proposed Structure for Screening Process

## Three step process

1. Primary screening step: Set of conservative criteria used to quickly identify non-HCICO sources. Failure to meet all criteria will require secondary screening.
2. Secondary screening step: Sources not meeting these primary criteria will undergo a more rigorous screening to separate non-HCICO sources from **potential-HCICO** sources.
3. Method 2B: **Potential-HCICO** sources will require a full Method 2B carbon intensity determination to determine if they are to be classified as HCICO.



# Some Issues Raised at First Meeting

- It was suggested and ARB agreed that a library of screened crude oil sources be established.
- The primary screening step should be very simple with as few parameters as possible. At the same time, the primary step must be rigorous enough to prevent a HCICO source being labeled as non-HCICO.
- Obtaining detailed information from producers may be difficult, especially for crude blends, crude purchased on the spot market, and crude oil produced from some jurisdictions which do not release reservoir and production data to the public.
- Concern was raised about having a process in place to expeditiously screen crude sources that will be entering California in 2011.





## Some other questions raised

- What databases and crude production information are available in the public domain?
- Can we rely on publically available data for the primary screening step?
- Can producers be enticed or required to provide necessary data for the screening process?
- Should a registration process be used for crude oil producers?



# Invited Participation by Stakeholders

Stakeholders who possess data or have conducted analyses that are relevant to the screening process (and especially the criteria to be used in the process) are invited to submit these materials to ARB and present at future meetings of the workgroup. This is intended to be a very open process and we welcome your technical input.



# **Presentation by Jacobs Consultancy and Life Cycle Associates**

[http://www.arb.ca.gov/fuels/lcfs/lcfs\\_meetings/050610jacobs-prstn.pdf](http://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/050610jacobs-prstn.pdf)

# Sources of Data

- Oil and Gas Journal Surveys

<http://ogjresearch.stores.yahoo.net/surveys.html>

- Worldwide Oil Field Production Survey
- EOR/Heavy Oil survey
- Oil Sands Projects

- NOAA/NGDC Global Gas Flaring Estimates

[http://www.ngdc.noaa.gov/dmsp/interest/gas\\_flares.html](http://www.ngdc.noaa.gov/dmsp/interest/gas_flares.html)

- EIA Company Level Imports

[http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/company\\_level\\_imports/cli.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/company_level_imports/cli.html)

- IHS Energy Databases

<http://energy.ihs.com/Products/product-listing.htm>

- Others?



# **“Revised” Primary Screening Step Presented for Discussion**

- Primary screening step criteria to be applied on a field-specific basis unless noted.
- Crude sources not meeting all criteria would require secondary screening.
- An example of screening criteria to identify non-HCICO production:
  - Crude oil produced by means other than enhanced oil recovery or crude bitumen mining.
  - Gas flaring (country basis) at a rate less than \_\_\_\_.
  - A combination of reservoir depth and field age as a proxy for production intensity.



# EOR and Mining

- Crude oil produced from fields using EOR or mining will require secondary screening.
- EOR includes injection of fluids other than water or methane to enhance oil recovery. Most significant of these are injection of steam or carbon dioxide.
- Oil and Gas Journal surveys for EOR and mining can be used to identify fields.



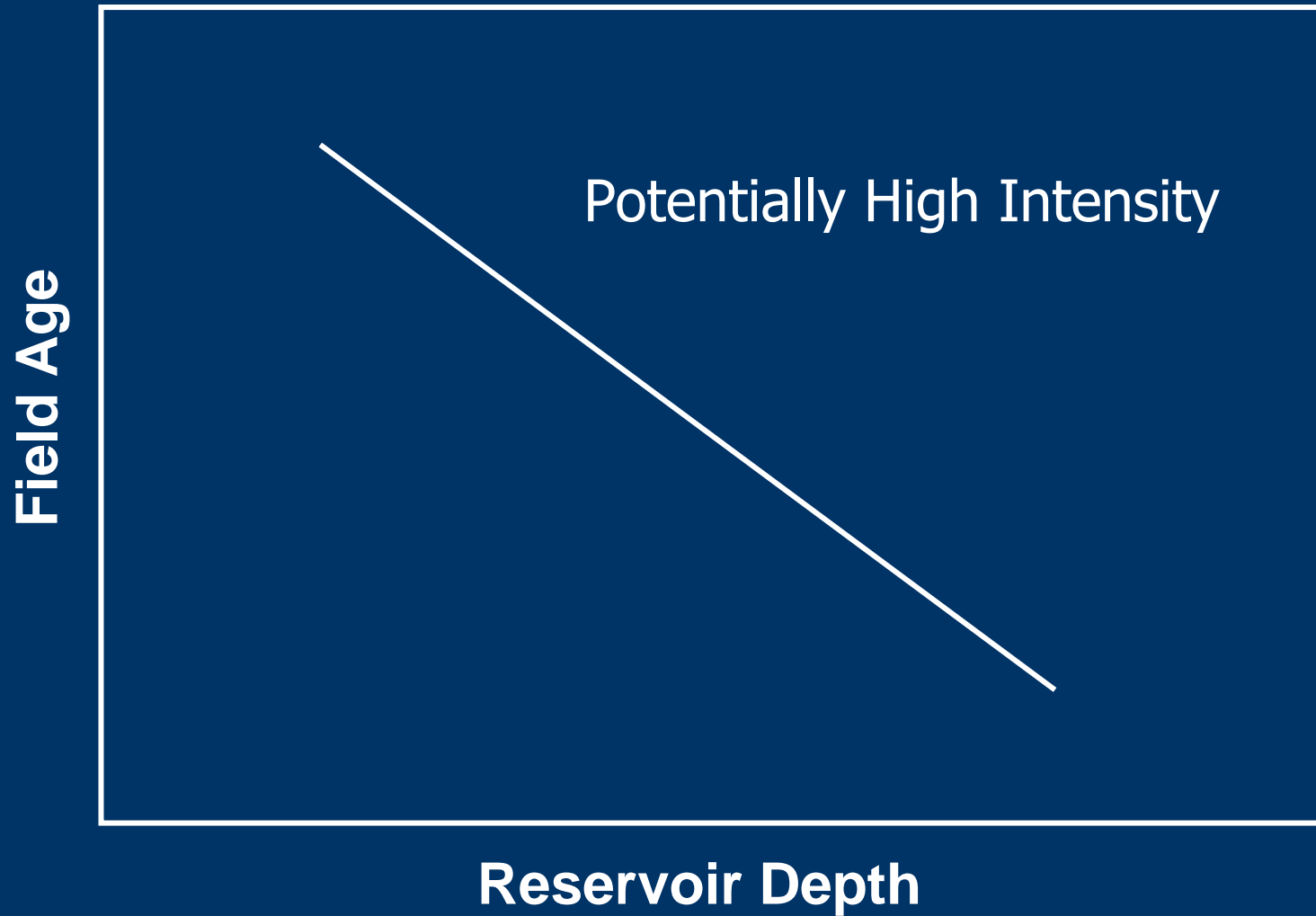
# Gas Flaring

- Flaring of 10 scm/bbl results in a carbon intensity **adjustment** of approximately  $3.4 \text{ gCO}_{2e}/\text{MJ}_{\text{crude}}$  assuming the flared gas consists of 100 percent methane and is completely combusted.
- Flaring values in the table are based on 2008 NOAA data and assume 100 percent of flaring is the result of crude oil production.

Country	Flaring (scm/bbl)
United States	1.3
Saudi Arabia	1.1
Iraq	7.9
Brazil	1.7
Canada	3.6
Russia	11.4
Nigeria	19.6
Gabon	20.1



# Intensity of Production





# **Discussion on Crude Screening Process**

# Future Steps

**Other Discussion Items?**

# Contact Information

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